REMARKS

Claims 1 and 5-28 remain pending in the application, wherein claims 1, 6, 20, and 23-25 have been amended. Applicants respectfully request reconsideration and allowance of the above-identified application in view of the foregoing amendments and the following remarks.

Preliminarily, Applicants wish to review the Restriction Requirement issued May 24, 2004 and the subsequent election in the reply filed on June 24, 2004. The Restriction Requirement as originally presented contained an inherent ambiguity that was remedied in the first substantive office action issued September 9, 2004. The Restriction Requirement of May 24, 2004 identified the following inventions:

I. Claims 1-3, 7-12 and 14-25 drawn to a two-component composition

II. Claims 4-6 and 23-25 drawn to a three-component composition

III. Claim 13 drawn to a three-component composition

Thus, claims 23-25 were included in both Groups I and II. In the face of this ambiguity, Applicants elected claims 1-3, 7-12 and 14-25 of Group I without traverse and indicated that only claims 4-6 and 13 were withdrawn from consideration as being drawn to a non-elected invention. The office action dated September 9, 2004 confirmed this reading of the Restriction Requirement by stating that "Claims 4-6 and 13 are withdrawn from further consideration.... Claims 1-3, 7-12 and 14-25 are generic to a plurality of disclosed patentably distinct species."

Subsequently, Applicants elected, as the stiff polymer, "polyethylene terephthalates modified by replacing a portion of the terephthalate groups with aliphatic diacid ester" and, as the soft polymer, "aliphatic polyester" which includes aliphatic-aromatic copolyesters. The independent claims as currently amended all read on, or are generic to, the elected invention (two-component composition) and species of stiff and soft polymers. Accordingly, only claims 4-6 and 13 remain withdrawn from consideration as being drawn to a non-elected invention.

Claim 1 as amended defines a biodegradable composition comprising at least one soft synthetic thermoplastic biodegradable polymer comprised of an aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate and at least one stiff synthetic thermoplastic biodegradable polymer having a glass transition temperature greater than about 10° C., wherein the biodegradable composition is suitable for formation into at least one of

sheets or films, and wherein the biodegradable composition is substantially free of thermoplastic starch made using high boiling liquid plasticizers. Claim 20 claims a similar composition but further requires a solid particulate in an amount of at least about 10% by weight of the biodegradable composition. Independent claims 23 and 25 were also amended to specify that the claimed biodegradable composition is substantially free of thermoplastic starch made using high boiling liquid plasticizers.

By requiring an aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate, claims 1 and 20 specifically include the preferred aliphatic-aromatic copolyesters disclosed in the application (page 26, lines 16-18 and page 27, lines 9-11), which yielded biodegradable compositions having superior results, as discussed in the application (page 50, line 8 – page 57, line 9; Figures 1-8) and further clarified in the declaration of Harald Schmidt submitted previously. On the other hand, an advantage of providing a biodegradable composition that is substantially free of thermoplastic starch made using high boiling liquid plasticizers, as now recited in all the independent claims, is that films, sheets and other articles made therefrom will not ooze or bleed glycerin or other high boiling liquid plasticizer over time. That is especially beneficial in the case of food wraps that are intended to come into contact with food. Application, page 9, lines 12-16.

The claims as amended distinguish over US 6,096,809 to Lorcks et al., which discloses compositions that always include thermoplastic starch made using high boiling liquid plasticizers such as glycerin, as explained in previous amendments. Whereas the Office Action takes the position that the claims as previously presented did not exclude the starch component disclosed in Lorcks et al. (*i.e.*, made using high boiling liquid plasticizers), the claims as now amended remove all doubt. An advantage of the compositions as now claimed, as compared to the compositions disclosed in Lorcks et al., is that films, sheets and other articles made from the claimed compositions will not ooze or bleed glycerin or other high boiling liquid plasticizer over time, which is especially beneficial in the case of food wraps that are intended to come into contact with food. Application, page 9, lines 12-16. Applicants also refer to the previously filed declaration of Harald Schmidt, which further explains the differences between starch made using high boiling liquid plasticizers as in Lorcks et al. and starch that is substantially free of high boiling liquid plasticizers, as well as the unexpected advantages of the latter relative to the former. In view of this, Applicants submit that the claims as now amended are neither

anticipated by, nor obvious over, Lorcks et al., either alone or in combination with any other art of record.

Claims 1 and 20 as amended distinguish over US 5,883,199 to McCarthy et al. as they claim, in combination with the other recited features, an aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate. Although McCarthy et al. discloses compositions that include PLA and BIONELLE, an aliphatic polybutylene succinate-adipate copolymer (col. 1, ll. 31-33; col. 4, ll. 7-38; Examples 1-4), McCarthy et al. neither teaches nor suggests biodegradable blends that include the combination of a stiff biodegradable polymer and a soft biodegradable polymer comprising an aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate. McCarthy et al. teaches that blends of PLA and BIONELLE are superior in many respects to PLA alone but provides no data regarding the effects obtained by blending a stiff biodegradable polymer and a specific aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate. Col. 4, ll. 52-67.

McCarthy et al. further discloses a broad genus of biodegradable polyesters, including the subgenus comprising "a copolyester of an aliphatic polyester and up to 50 percent, by weight, of an aromatic polyester, such as terephthalate", but does not provide any teaching or suggestion that would have motivated one of skill in the art to specifically select, from among the broad genus of known biodegradable polyesters, an aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate. Accordingly, one or skill in the art would not have been motivated to modify the compositions of McCarthy et al. to include, in combination with a stiff biodegradable polymer, an aliphatic-aromatic copolyester that is specifically formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate. Absent some teaching in the art suggesting the desirability of blending an aliphatic-aromatic copolyester formed from 1,4-butanediol, adipic acid, and dialkyl terephthalate with a stiff biodegradable polymer, claims 1 and 20 are believed to be unobvious over McCarthy et al., either alone or in combination with any other art of record.

Claim 25 as amended alternatively defines sheet or film formed from a biodegradable composition comprising a soft synthetic thermoplastic biodegradable polymer comprised of an aliphatic-aromatic copolyester and a stiff thermoplastic biodegradable polymer selected from the group consisting of polyesteramides, polyethylene terephthalates modified by replacing a portion of terephthalate groups with aliphatic diacid ester groups, terpolymers including units formed

from each of glycolide, lactide and ε-caprolactone, and thermoplastic starch that is substantially free of high boiling liquid plasticizers, wherein the biodegradable composition is formed into the sheet or film by extrusion, film-blowing, or casting and wherein the biodegradable composition is substantially free of thermoplastic starch made using high boiling liquid plasticizers. Though McCarthy et al. discloses polylactic acid homopolymers and also copolymers having the formula —$(R_1)_a$—$(R_2)_b$— (col. 2, l. 61 – col. 3, l. 1), McCarthy et al. does not disclose nor suggest the use of any of the stiff biodegradable polymers recited in claim 25 as amended. Unless there is some teaching or suggestion in the art that would have motivated one of skill in the art to substitute the polylactic acid homopolymers and copolymers having the formula —$(R_1)_a$—$(R_2)_b$— of McCarthy et al. with one or more of the biodegradable polymers recited in claim 25, claim 25 as amended is unobvious over McCarthy et al., either alone or in combination with any other art of record. For example, neither Lorcks et al. nor US 5,817,721 to Warzelhan et al. teach or suggest polymer blends that include one or more of the specific stiff biodegradable polymers recited in claim 25 as amended and a soft thermoplastic polymer as claimed. Accordingly, Applicants submit that claim 25 as amended is patentable over the art of record.

Claim 23 as amended also recites a composition that is neither taught nor suggested in the art. Applicants disagree with the argument at the end of the Office Action alleging that McCarthy discloses a composition that includes a "soft" aliphatic-aromatic copolyester in combination with PLA. According to the claim 23, the term "soft synthetic thermoplastic polymer" is defined as a polymer "having a glass transition temperature less than about 0° C". However, the Office Action fails to provide any evidence that the copolyester disclosed in McCarthy et al. consisting of an aliphatic polyester and up to 50% of an aromatic polyester such as polyethylene terephthalate has a glass transition temperature that is less than about 0° C. Thus, the Office Action fails to show where every limitation recited in claim 23 is disclosed in the prior art, as is required to establish a *prima facie* case of obviousness.

Instead, the Office Action focuses on the statement in McCarthy et al. that the copolyester "imparts ductility to polylactic acid-based polymers". However, whether or not a polymer imparts ductility to PLA is not the standard for determining whether a polymer is a "soft" polymer within the scope of claim 23. Moreover, whether a polymer imparts ductility to PLA is a notoriously low standard of "ductility" in light of the fact that PLA is known to be quite brittle, with the brittleness of PLA increasing over time, as is taught in McCarthy et al. Col. 2, ll.

3-6. Because PLA is brittle, any polymer that is less brittle than PLA would be expected to impart some ductility to PLA beyond what it initially lacks on its own. For example, BAK, a polyesteramide made by Bayer, is characterized in the Application as a "stiff" polymer and yet is more ductile than PLA owning to its having a glass transition temperature (about 10°C) that is significantly lower than the glass transition temperature of PLA (about 59 °C). Thus, even though BAK is no doubt softer than PLA and able to impart ductility to PLA, BAK does not fall within the definition of a "soft" biodegradable polymer because it does not have a glass temperature within the claimed range. In view of this, the ability of a polymer to impart ductility when blended with PLA is not what defines whether a biodegradable polymer is "soft" but rather its glass transition temperature.

With respect to the issue of glass transition temperature, Applicants have presented documentary evidence in the previous amendment showing that the glass transition temperature of copolyesters of aliphatic polyesters and polyethylene terephthalate is much higher than 0° C (*i.e.*, greater than 40°C based on the teachings of Annan et al. and the document attached as Exhibit A to the previous amendment). Unless the PTO can provide evidence that copolyesters of aliphatic polyesters and polyethylene terephthalate inherently have a glass transition temperature below about 0° C, Applicants have, by their proffer of unrebutted evidence, shown that McCarthy et al. does not inherently disclose aliphatic-aromatic copolyesters having a glass transition temperature below about 0° C. That the copolyesters of McCarthy et al. might impart ductility to PLA is no more evidence of their being "soft" than the ability of BAK (a "stiff" polymer) to impart ductility to PLA (an even "stiffer" polymer). Again, the ability to impart ductility to PLA is simply not the test of whether a polymer is a "soft" polymer. The test is having glass transition temperature within the parameters defined in the claims.

In short, because the Office Action fails to provide any evidence regarding glass transition temperature, the Office Action fails to *prima facie* establish that McCarthy et al. does, in fact, disclose a "soft" aliphatic-aromatic copolyester. Moreover, Applicants have provided evidence that casts doubt as to whether McCarthy et al. inherently discloses a "soft" aliphatic-aromatic copolyester. That the copolyester of McCarthy et al. might impart ductility to brittle PLA only means that it presumptively has a glass temperature that is somewhat less than that of PLA (59°C), not that it necessarily has a glass temperature that is less than about or 0° C.

Claims 1, 5-12, 14-19, 25 and 26 are provisionally rejected on the grounds of non-statutory obviousness-type double patenting relative to the claims of copending Application No. 11/103,999. Because this rejection is provisional, Applicants will consider filing a Terminal Disclaimer, if appropriate, upon the allowance of said copending Application No. 11/103,999.

In the event that the Examiner finds any remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview or that may be overcome by examiner amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 3rd day of May 2006.

Respectfully submitted,

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